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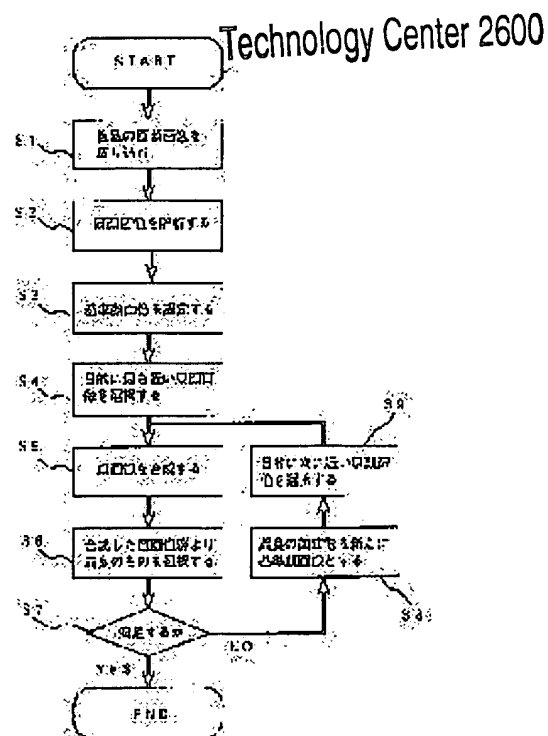
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(54) MANUFACTURE OF FACE IMAGE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a manufacture of face images capable of easily obtaining the expression corresponding to a purpose of an object.

SOLUTION: The plural different source face images of the same object are stored in a memory as bit map image data (step S1), analysis is performed so as to detect respective expression feature data from the source face images (step S2), a reference face image provided with average expression feature data is set (step S3) and the source face image closest to the purpose is selected (step S4). An expression feature data group is estimated so as to be linearly dotted between the reference face image and the selected source face image and within a range capable of allowing that it is the object on the extension, the plural face images are synthesized based on the data (step S5) and the best one is selected from a synthesized face image group (step S6).



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The field of the technique in which invention belongs] This invention relates to the manufacture approach of a face image that the face image of the expression according to the hope of a photographic subject is mainly obtained. that the face image manufactured by this invention is printed out as a photograph **** -- a value monitor -- it projects or is incorporated by memory, such as a magnetic disk, a magnetic tape, and a magneto-optic disk, as digital data.

[0002]

[Description of the Prior Art] Conventionally, when taking a portrait photograph, in a photo studio, it carries out under the set of a moderate lighting etc.

[0003] In this case, since a cameraman catches and photos a moment for a good picture which suits the hope of a photographic subject most when the cameraman who has the technique which fully became skillful takes a photograph, it is said that a photographic subject is satisfied. However, a cameraman directs, a photographic subject is made to make a pause and expression generally, and taking a photograph by the moment for a good picture which a cameraman wishes is performed. Therefore, the present condition is that a photograph is not taken [which satisfies the hope of a photographic subject especially about the expression of a face] like. The face image regarded as general and the it of a photographic subject being desirable is found out in a certain instant in the motion reflected to the video image, and an instant in the mirror reflected at a certain time, and is held in its inside as a concept. Therefore, a photographic subject has the comment of if reflected to if reflected to a little quieter expression about the taken photograph, the expression which became tight to a slight degree in very many cases.

[0004] The correction technique of a photograph is known as a means to solve this.

[0005]

[Problem(s) to be Solved by the Invention] However, even if the correction technique of this photograph not only requires an advanced technique, but it carries out it with that advanced technique, it cannot satisfy the above-mentioned request matter of a photographic subject. That is, after photography, when this technique was able to be burned in a photograph, by changing a partial color tone, it is not able to stop at the level of improving the glow of a face or removing a wrinkle, and was not able to correct the expression of a face image itself.

[0006] Therefore, this invention solves the above-mentioned problem and aims at offering the manufacture approach of a face image that the expression according to the purpose of a photographic subject is obtained easily.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, it stores in memory by making into a bit map image data the original face image with which the plurality of the same photographic subject differs. Analyze so that each expression description data may be detected from a original face image, and a criteria face image with the average expression description data is set up. It is

presumed that it is linearly dotted by the expression description data constellation within limits which are before the original face image which chose the original face image nearest to the purpose, and was chosen from the criteria face image, and on the extension, and can be permitted as it is a photographic subject. It constituted so that the best thing might be chosen from the face image group which compounded and compounded two or more face images based on this data.

[0008] Moreover, when there was no image which can be satisfied into the compound face image group, the best face image by the above-mentioned composition was newly used as the criteria face image, and the original face image near a degree was chosen as the purpose, and it constituted so that composition of a face image might be repeated.

[0009] Moreover, when compounding a face image, it constituted so that plurality or all image elements might be synchronously compounded among the image elements which constitute a criteria face image.

[0010]

[Embodiment of the Invention] Hereafter, the manufacture approach of the face image of this invention is explained in detail, referring to a drawing. Drawing showing one example of a original face image [in / in a flow chart, drawing 2 , and drawing 3 for drawing 1 to explain the manufacture approach of the face image of this invention / this invention], drawing showing one example of a criteria face image [in / in drawing 4 / this invention], drawing 5 and the principle explanatory view of composition of a face image [in / in drawing 6 / this invention], and drawing 7 are drawings showing one example of the face image compounded by this invention.

[0011] The manufacture approach of the face image of this invention is performed as follows according to the flow chart shown in drawing 1 .

[0012] : which captures two or more original face images (step S1) -- a original face image photographs the face of the same photographic subject on the almost same photography conditions, and more possible ones are desirable. Usually, 50 or more sheets are prepared (refer to drawing 2 and drawing 3). Moreover, it is desirable to choose the thing near the purpose and to use it as a original face image. As photography conditions, the light source is arranged in the transverse-plane upper part of a face, and making a background into monochrome etc. is mentioned, for example. Incorporation of a original face image is read from the already taken photograph using a scanner, or photos a photographic subject using a video camera, a digital camera, etc., and stores it in memory as a bit map image data.

[0013] : (step S2) which analyzes a original face image -- the image field is recognized about some image elements based on the pattern recognition technique, such as edge detection and field detection, among the eye, the nose, opening, the eyebrows, the profile, the skin, etc. which constitutes a face from on a bit map image data. From this recognition data, coordinate values, such as the focus of each image element, for example, the core of a pupil, the both ends of eyebrows, the both ends of a lip, etc., are temporarily measured by making the head of a nose into a reference point, and the curve degree of whenever [distance / between image elements / or angular relation / of an image element], or an image element is calculated. Moreover, the average of color data or gloss data is calculated for every original face image from the image field of the skin. These results of an operation are called the expression description data of a original face image. Work "the possible three-dimension face image composition system of expression and age change" (Japanese Society for Artificial Intelligence study group data SIG-HICG -9103-2 (1/24)) besides ***** is one of those showed an example of the approach of asking for the focus.

[0014] : (step S3) which sets up a criteria face image -- the average of the expression description data of all original face images is calculated. The image which has this average-value data is used as a criteria face image, and it expresses to a monitor etc. (refer to drawing 4).

[0015] The original face image nearest to the purpose is chosen (step S4). : Select what has the photographic subject closest to a desired expression from original face images (refer to drawing 2). This selection looks at the image displayed on the monitor, and is performed according to the intention of a photographic subject etc.

[0016] A face image is compounded (step S5). : Calculate presumption so that the expression description data constellation may be linearly dotted within limits which are before the original face

image chosen from the criteria face image, and on the extension, and can be permitted as it is a photographic subject (refer to drawing 5), change into a bit map image data two or more expression description data obtained by the operation, and make a monitor display. In addition, let tolerance 2 of face image composition be the range which encloses the whole original face image 1 group about. Moreover, in case a face image is compounded, plurality or all image elements are synchronously compounded among image elements, such as the eye, a nose, opening, eyebrows, a profile, the skin, etc. which constitutes a criteria face image.

[0017] : (step S6) which chooses the best thing from the compound face image group -- this selection looks at the bitmapped image displayed on the monitor, and is performed according to the intention of a photographic subject etc.

[0018] : (step S7) which checks whether it is satisfied with the face image chosen at step S6, or it does not carry out -- satisfied -- if it becomes, manufacture processing of a face image will be completed now. It repeats until it newly uses as a criteria face image the best face image 5 which is not satisfied and which was chosen at step S6 as it was shown in drawing 6 , if it became (step S8), it chooses the original face image 6 near a degree as the purpose (step S9) and a satisfying face image is obtained in the activity not more than S5. The direction of correction is determined using the keyword which shows a desired expression in this case, and a face image is obtained for a far satisfying thing rather than it obtains a face image automatically.

[0019] The face image (refer to drawing 7) obtained by the above processing is outputted with image output units, such as a printer.

[0020]

[Effect of the Invention] Since the manufacture approach of the face image of this invention is constituted as mentioned above, the following effectiveness is done so. That is, whether it is not the cameraman who has the technique which fully became skillful since it enabled it to compound expression of a original face image by computer, or this invention does not have advanced correction skill, it can obtain easily the face image of expression according to the hope of a photographic subject.

[Translation done.]



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CLAIMS

[Claim(s)]

[Claim 1] It stores in memory by making into a bit map image data the original face image with which the plurality of the same photographic subject differs. Analyze so that each expression description data may be detected from a original face image, and a criteria face image with the average expression description data is set up. It is presumed that it is linearly dotted by the expression description data constellation within limits which are before the original face image which chose the original face image nearest to the purpose, and was chosen from the criteria face image, and on the extension, and can be permitted as it is a photographic subject. The manufacture approach of the face image characterized by choosing the best thing from the face image group which compounded and compounded two or more face images based on this data.

[Claim 2] The manufacture approach of the face image according to claim 1 which newly uses the best face image by the above-mentioned composition as a criteria face image, chooses the original face image near a degree as the purpose, and repeats composition of a face image when there is no image which can be satisfied into the compound face image group.

[Claim 3] The manufacture approach of a face image given in either claim 1 which synchronizes and compounds plurality or all image elements among the image elements which constitute a criteria face image in case a face image is compounded, or claim 2.

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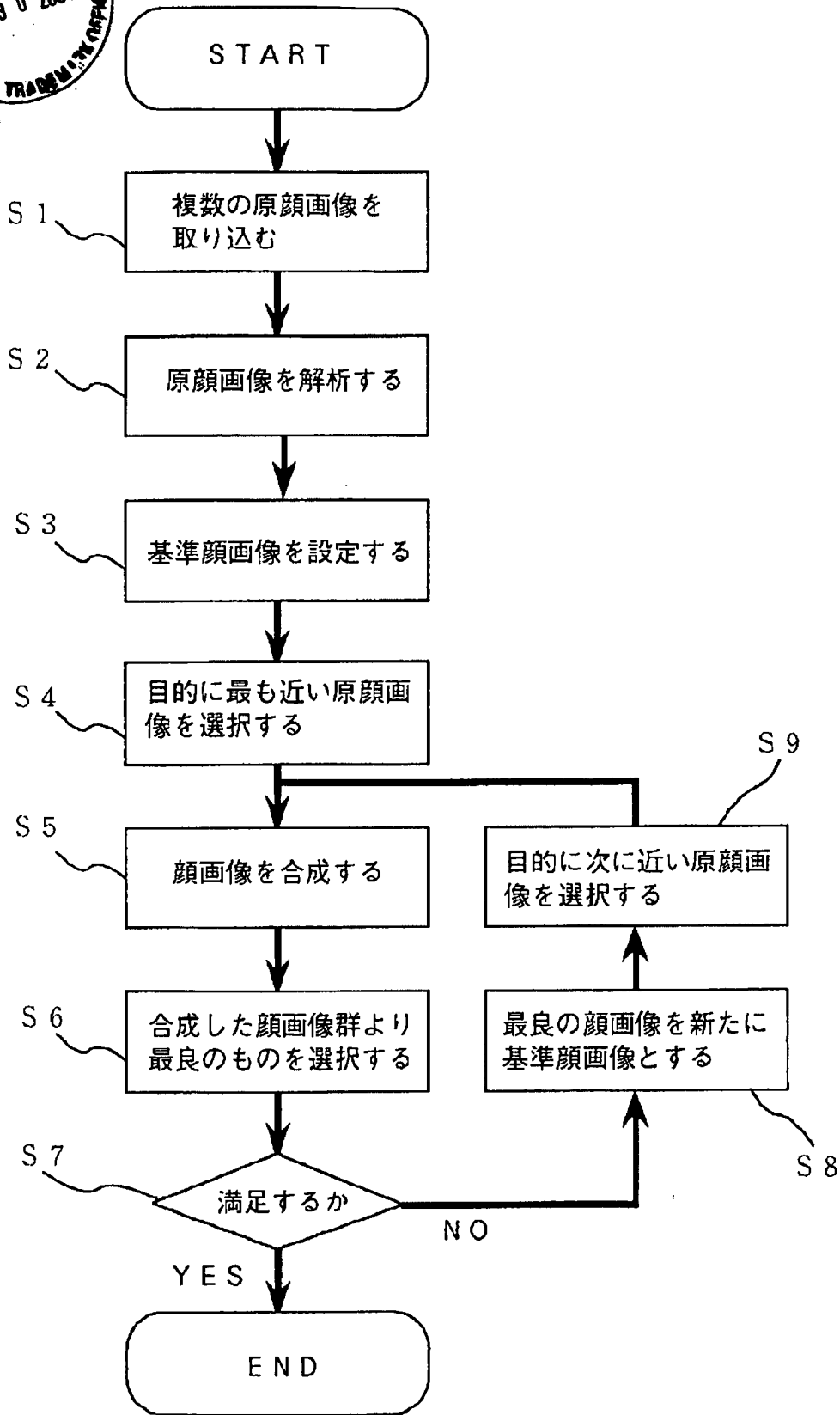
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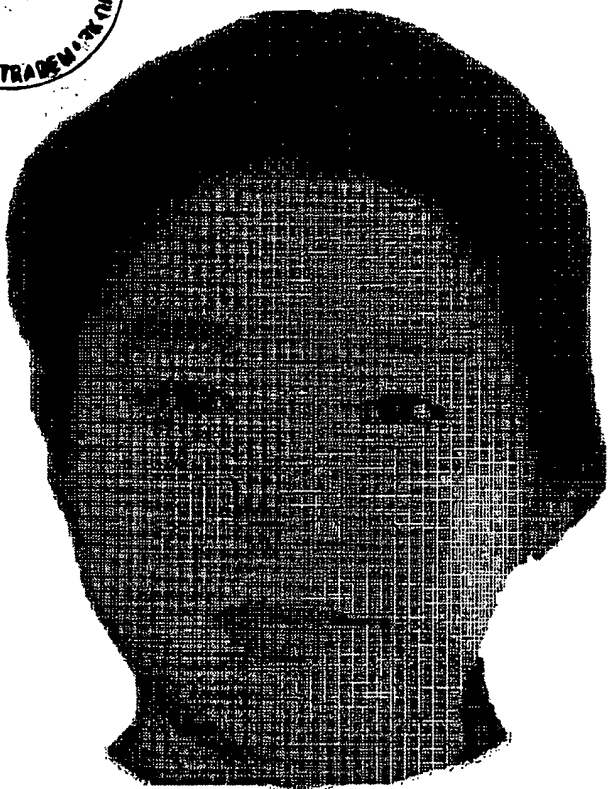
DRAWINGS

[Drawing 1]

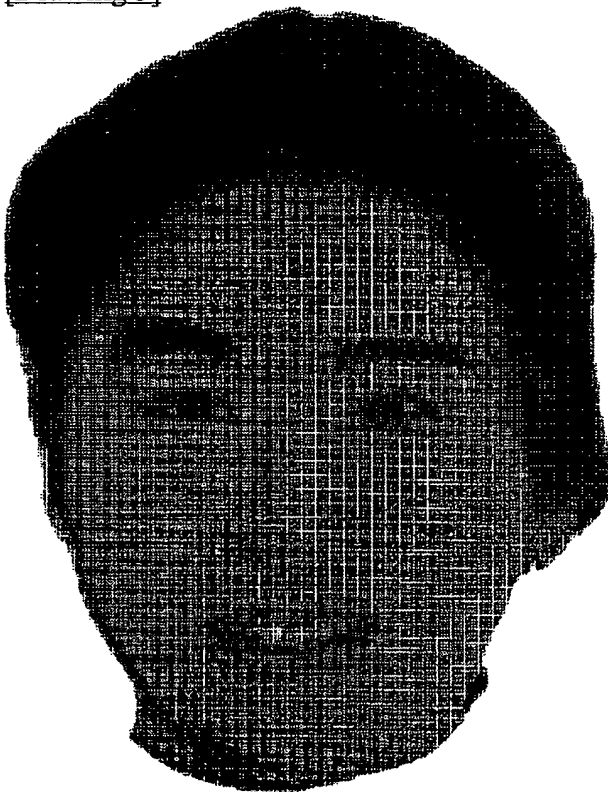
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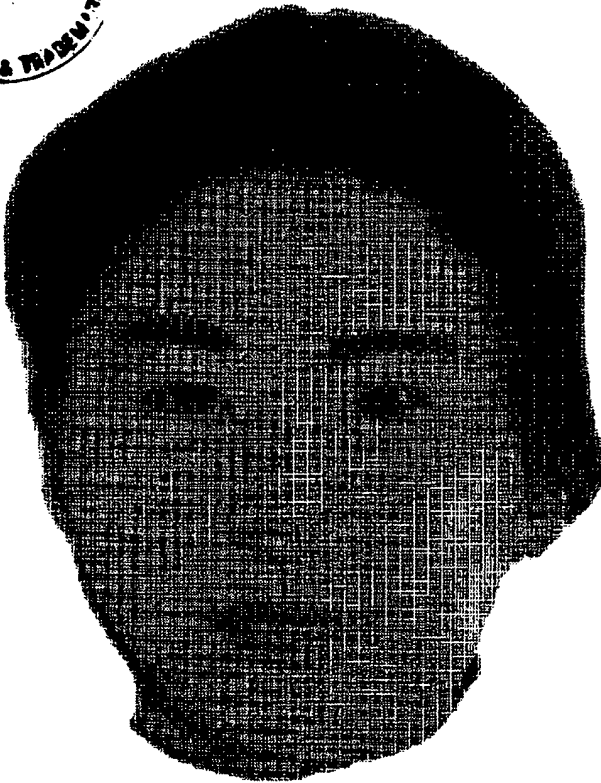
[Drawing 2]



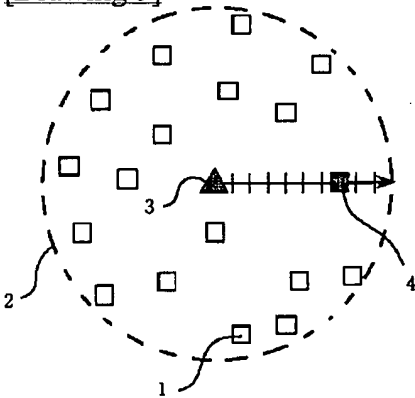
[Drawing 3]



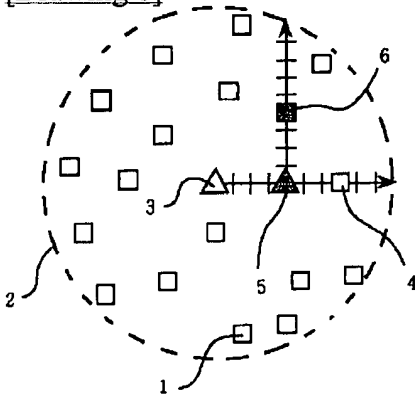
[Drawing 4]



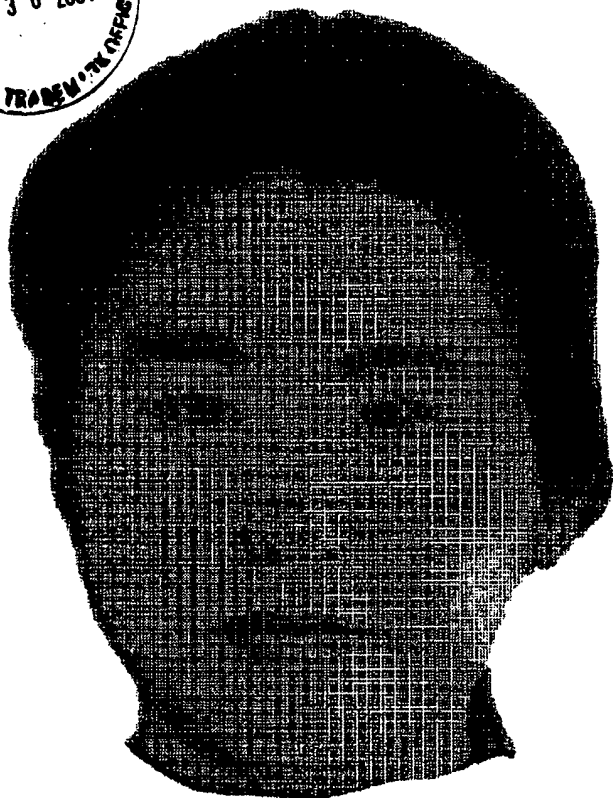
[Drawing 5]



[Drawing 6]



[Drawing 7]



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